Status of the neutron capture measurement on ^{237}Np with the DANCE array at LANSCE

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Neptunium-237 is a major constituent of spent nuclear fuel. Estimates place the amount of ^{237}Np bound for the Yucca Mountain high-level waste repository at 40 metric tons. The Department of Energy's Advanced Fuel Cycle Initiative program is evaluating methods for transmuting the actinide waste that will be generated by future operation of commercial nuclear power plants. The critical parameter that defines the transmutation efficiency of actinide isotopes is the neutron fission-to-capture ratio for the particular isotope in a given neutron spectrum. The calculation of transmutation efficiency therefore requires accurate fission and capture cross sections.

Current ^{237}Np evaluations available for transmuter system studies show significant discrepancies in both the fission and capture cross sections in the energy regions of interest. Therefore, a measurement of the neutron capture cross section at the DANCE array was proposed. The current status of this experiment will be presented.

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